Appln. No. 09/432,272
Amendment After Final Rejection dated September 12, 2003
Response to Office Action dated March 18, 2003

This listing of claims will replace all prior versions, and listing, of claims in the

application.

LISTING OF CLAIMS:

1. (Currently Amended) An ink cartridge configured to be detachably attached to

a printer, said ink cartridge comprising:

an ink reservoir in which an ink used for printing is kept; and

a sequential access storage unit storing specific information in a readable,

writable, and non-volatile manner, wherein the specific information comprises an ink quantity-

relating information relating to a quantity of ink kept in said ink reservoir,

wherein the storage unit is sequentially accessed in synchronism with a clock

signal, and has an ink quantity information storage area storing the ink quantity-relating

information, and wherein the ink quantity information storage area is located at a specific area

that is the area located within the sequential access storage unit that is accessed for rewriting first

by said printer first before accessing for rewriting any other area within the sequential access

storage unit where another type of information is stored.

2. (Original) An ink cartridge in accordance with claim 1, wherein said ink

reservoir comprises a specific number of ink chambers corresponding to a number of different

inks used for printing, and the ink quantity information storage area has a storage capacity

according to the number of different inks.

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3. (Original) An ink cartridge in accordance with claim 2, wherein the ink quantity information storage area has a storage capacity of at least three bytes.

4. (Withdrawn) 4. An ink cartridge in accordance with claim 3, wherein the ink quantity-relating information is written into the ink quantity information storage area at a time of replacement of said ink cartridge and/or at a power-off time of said printer..

5. (Original) An ink cartridge in accordance with claim 3, wherein said ink reservoir has at least three ink chambers, in which at least three different color inks are kept respectively,

the ink quantity information storage area having a plurality of memory divisions, wherein the plurality of memory divisions store pieces of information relating to quantities of the at least three different color inks kept in said respective ink chambers independently,

a storage capacity of at least one byte being allocated to each of the plurality of memory divisions.

6. (Original) An ink cartridge in accordance with claim 3, wherein the ink quantity information storage area has a storage capacity of at least five bytes,

said ink reservoir having at least five ink chambers, in which at least five different color inks are kept respectively,

the ink quantity information storage area having a plurality of memory divisions, wherein the plurality of memory divisions store pieces of information relating to quantities of the at least five different color inks kept in said respective ink chambers independently,

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a storage capacity of at 'least one byte being allocated to each of the plurality of

memory divisions.

7. (Original) An ink cartridge in accordance with claim 6, wherein the at least five

different color inks comprise three deep color inks and two light color inks, the two light color

inks correspond to two deep colors among the three deep color inks,

in the ink quantity information storage area, the memory divisions for storing the

pieces of information regarding the three deep color inks being located at a first place written

first by said printer, and the memory divisions for storing the pieces of information regarding the

two light color inks being located at a second place written next by said printer.

8. (Original) An ink cartridge in accordance with claim 7, wherein the three deep

color inks are cyan, magenta, and yellow, and the two light color inks are light cyan and light

magenta.

9. (Original) An ink cartridge in accordance with claim 8, wherein the pieces of

information relating to the remaining quantities of the respective inks are written into the

memory divisions at a time of replacement of said ink cartridge and/or a power-off time of said

printer.

10. (Cancelled).

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11. (Previously Presented) An ink cartridge in accordance with any one of claims
1 through 9, wherein said storage unit has a plurality of storage areas, and

the ink quantity information storage area is a first storage area located at a head of
the plurality of storage areas included in said storage unit.

12. (Previously Presented) An ink cartridge in accordance with any one of claims
1 through 9, wherein said storage unit has a plurality of storage areas,

the ink quantity information storage area is a last storage area located at an end of
the plurality of storage areas included in said storage unit.

13. (Original) An ink cartridge in accordance with claim 12, wherein the ink
quantity-relating information regards a remaining quantity of ink in said ink reservoir.

14. (Original) An ink cartridge in accordance with claim 12, wherein the ink
quantity-relating information regards a cumulative amount of ink consumption with regard to
said ink reservoir.

15. (Currently Amended) An ink cartridge configured to be detachably attached to
a printer, said ink cartridge comprising:

an ink reservoir in which an ink used for printing is kept; and

a sequential access storage unit storing specific information in a readable,
writable, and non-volatile manner and being sequentially accessed in synchronism with a clock
signal, said storage unit having a first storage area, in which a plurality of read only information

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is stored, and a second storage area, which is ~~arranged at a location accessed for rewriting prior to the first storage area and in which rewritable information is stored~~the area located within the storage unit that stores rewritable information relating to a quantity of ink kept in said ink reservoir and is accessed for rewriting by said printer first before accessing for rewriting any other area within the storage unit;

~~wherein the specific information comprises information relating to a quantity of ink kept in said ink reservoir.~~

16. (Original) An ink cartridge in accordance with claim 15, wherein the rewritable information stored in the second storage area comprises a piece of information on a remaining quantity of ink in said ink reservoir, wherein the piece of information on the remaining quantity of ink is calculated by said printer from an amount of ink consumption used for printing.

17. (Original) An ink cartridge in accordance with claim 15, wherein said ink reservoir has a plurality of ink chambers, in which a plurality of different color inks are kept respectively,

wherein the rewritable information stored in the second storage area comprises plural pieces of information on remaining quantities of the different color inks kept in the respective ink chambers, and wherein the plural pieces of information on remaining quantities of the different color inks are calculated by said printer.

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18. (Original) An ink cartridge in accordance with claim 15, wherein the

rewritable information stored in the second storage area comprises a piece of information on an

amount of ink consumption with regard to said ink reservoir, which is obtained from an amount

of ink consumption used for printing.

19. (Original) An ink cartridge in accordance with claim 18, wherein the piece of

information on the amount of ink consumption takes an initial value in a range of zero to a

predetermined value.

20. (Original) An ink cartridge in accordance with claim 17, wherein the second

storage area has at least two memory divisions, into which a latest piece of information on the

remaining quantity of ink is written sequentially.

21-22. (Cancelled).

23. (Previously Presented) An ink cartridge in accordance with any one of claims

1 through 9 and 15 through 20, wherein said storage unit is an EEPROM.

24. (Withdrawn) An ink cartridge in accordance with any one of claims 1 through

9 and 15 through 20, wherein said storage unit has format information relating to items of

information stored therein.

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25. (Withdrawn) An ink cartridge in accordance with claim 24, wherein the

format information is registered in a head area of said storage unit.

26. (Withdrawn) An ink cartridge configured to be detachably attached to a

printer, said ink cartridge comprising:

an ink reservoir in which an ink used for printing is kept; and

a storage unit having a plurality of ink quantity information memory divisions and

a plurality of write complete information storage areas, and the storage unit storing specific

information in a readable, writable, and non-volatile manner,

wherein the specific information comprises information relating to a quantity of

ink kept in said ink reservoir, wherein the plurality of ink quantity information memory divisions

store the ink quantity-relating information, and wherein the plurality of write complete

information storage areas respectively correspond to the plurality of ink quantity information

memory divisions and in each of which write complete information is registered when a writing

operation into the corresponding ink quantity information memory division is completed.

27. (Withdrawn) An ink cartridge in accordance with claim 26, said ink cartridge

comprising:

a plurality of ink reservoirs, in which a plurality of inks are kept respectively; and

a plurality of ink quantity information memory divisions and a plurality of write

complete information storage areas provided for each of said plurality of ink reservoirs.

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28. (Withdrawn) An ink cartridge in accordance with claim 27, wherein said

storage unit has two ink quantity information memory divisions, and each write complete

information storage area is located following an end-of-writing position in each, of the ink

quantity information memory divisions.

29. (Withdrawn) An ink cartridge in accordance with claim 28, wherein a

predetermined flag is written into each of the write complete information storage areas when the

writing operation has been completed in the corresponding ink quantity information memory

division, and

the predetermined flag has different initial values with regard to the respective

write complete information storage areas.

30. (Withdrawn) An ink cartridge in accordance with claim 28, wherein a

predetermined flag is written into each of the write complete information storage areas when the

writing operation has been completed in the corresponding ink quantity information memory

division, and

the predetermined flag has an identical initial value with regard to the respective

write complete information storage areas.

31. (Withdrawn) An ink cartridge in accordance with claim 30, wherein the ink

quantity information memory divisions are included in a specific area of said storage unit that is

written first by said printer.

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32. (Withdrawn) An ink cartridge in accordance with claim 31, wherein said

storage unit is sequentially accessed in synchronism with a clock signal.

33. (Withdrawn) An ink-cartridge in accordance with claim 32, wherein the ink

quantity-relating information regards a remaining quantity of ink in said ink cartridge.

34. (Withdrawn) An ink cartridge in accordance with claim 32, wherein the ink

quantity-relating information regards a cumulative amount of ink consumption with regard to

said ink cartridge.

35. (Currently Amended) A method of writing plural pieces of specific

information into an ink cartridge, said ink cartridge being configured to be detachably attached to

a printer and having a sequential access storage element, said method comprising the steps of:

(a) ~~providing~~receiving the plural pieces of specific information that are to be

written into said storage element by said printer, wherein the plural pieces of specific

information comprises information relating to a quantity of ink kept in said ink cartridge and

other information; and

(b) rewriting the ink quantity-relating information into said storage element,

preferentially over the other pieces of specific information at an area within the storage element

that is the area located within the storage element that is accessed for rewriting first before

accessing for rewriting any other area within the storage element.

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36. (Original) A method in accordance with claim 35, wherein the writing operation of the ink quantity-relating information into said storage element in said step (b) is carried out at a time of replacement of said ink cartridge and/or at a power-off time of said printer.

37. (Original) A method in accordance with claim 35 further comprising the step of:

(c) arranging the plural pieces of specific information in a certain sequence that allows the ink quantity-relating information to be located in a specific storage capacity from a head, which is determined according to a specific number of different inks,

wherein the step (b) writes the plural pieces of specific information into said storage element in the arranged sequence.

38. (Original) A method in accordance with claim 37 further comprising the step of:

(c-1) arranging the plural pieces of specific information in a certain sequence that allows the pieces of information relating to the quantities of the at least three different color inks to be located in a storage capacity of at least three bytes from a head,

wherein the step (b) writes the plural pieces of information into said storage element in the arranged sequence.

39. (Original) A method in accordance with claim 37 further comprising the step of:

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arranging the plural pieces of specific information in a certain sequence that

allows the pieces of information relating to the quantities of the at least five different color inks

to be located in a storage capacity of at least five bytes from a head,

wherein the step (b) writes the plural pieces of information into said storage

element in the arranged sequence.

40. (Original) A method in accordance with claim 39, wherein the at least five

different color inks comprise three deep color inks and two light color inks, which correspond to

two deep colors among the three deep color inks,

the plural pieces of specific information being arranged in said step (c-2) in such a

manner that the pieces of information regarding the three deep color inks are located prior to the

pieces of information regarding the two light color inks.

41. (Original) A method in accordance with claim 40, wherein the three deep

color inks are cyan, magenta, and yellow, and the two light color inks are light cyan and light

magenta.

42. (Original) A method in accordance with claim 41, wherein the plural pieces of

specific information are written into said storage element by sequential accesses.

43. (Original) A method in accordance with claim 42, wherein the ink quantity-

relating information regards a cumulative amount of ink consumption with regard to said ink

cartridge.

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44. (Original) A method in accordance with claim 42, wherein the ink quantity-relating information regards a remaining quantity of ink in said ink cartridge.

45. (Withdrawn) A method of writing specific information into an ink cartridge, said ink cartridge being configured to be detachably attached to a printer and having a storage element, said method comprising the steps of:

(a) providing the specific information that is to be written into said storage element by said printer, the specific information comprising information relating to a quantity of ink kept in said ink cartridge;

(b) writing the ink quantity-relating information into a plurality of ink quantity information memory divisions, which are included in- said storage element; and

(c) writing write complete information into a write complete information storage area when the writing operation of the ink quantity-relating information into each of the ink quantity information memory divisions has been completed, wherein the write complete information storage area is provided corresponding to each of the ink quantity information memory divisions in said storage element.

46. (Withdrawn) A method in accordance with claim 45, said method further comprising the step of:

(d) determining whether the writing operation of the ink quantity-relating information into each of the ink quantity information memory divisions in said step (b) has been carried out properly, based on values of the ink quantity-relating information written in the ink

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quantity information memory divisions and values of the write complete information written in

the write complete information storage areas.

47. (Withdrawn) A method of writing specific information into an ink cartridge,

said ink cartridge being configured to be detachably attached to a printer and having a storage

element, said method comprising the steps of:

(a) providing the specific information that is to be written into said storage

element by said printer, the specific information comprising information relating to a quantity of

ink kept in said ink cartridge;

(b) writing first ink quantity-relating information into a first ink quantity

information memory division, which is included in said storage element;

(c) writing first write complete information into a first write complete information

storage area when the writing operation of the first ink quantity-relating information into the first

ink quantity information memory division has been completed, wherein the first write complete.

information storage area is provided corresponding to the first ink quantity information memory

division in said storage element;

(d) writing second ink quantity-relating information into a second ink quantity

information memory division after the writing operation of the first write complete information

into the first write complete information storage area has been completed, wherein the second

ink quantity information memory division is included in said storage element; and

(e) writing second write complete information into a second write complete

information storage area when the writing operation of the second ink quantity-relating

information into the second ink quantity information memory division has been completed,

wherein the second write complete information storage area is provided corresponding to the

second ink quantity information memory division in said storage element.

48. (Withdrawn) A method in accordance with claim 47, said method further

comprising the step of:

(f) determining whether the writing operations of the first ink quantity-relating

information and the second ink quantity-relating information respectively into the first and

second ink quantity information memory

divisions in said steps (b) and (d) have been carried out properly, based on values

of the first ink quantity-relating information and the second ink quantity-relating information

written in the first and second ink quantity information memory divisions and values of the first

write complete information and second write complete information written in the first and

second write complete information storage areas.

49. (Withdrawn) A method in accordance with claim 48, wherein said step (f)

determines that the writing operations of the first ink quantity-relating information and the

second ink quantity-relating information respectively into the first and second ink quantity

information memory divisions have been carried out properly, in the case where the first ink

quantity-relating information stored in the first ink quantity information memory division

coincides with the second ink quantity-relating information stored in the second ink quantity

information memory division.

50. (Withdrawn) A method in accordance with claim 49, wherein the first write complete information and the second write complete information have a certain combination of preset initial values,

said method further comprising the step of:

(g) identifying a combination of a current value of the first write complete information with a current value of the second write complete information, in the case where the first ink quantity-relating information stored in the first ink quantity information memory division does not coincide with the second ink quantity-relating information stored in the second ink quantity information memory division,

wherein said step (f) determines that the writing operation of the first ink quantity-relating information into the first ink quantity information memory division has been carried out properly, in the case where the combination of the current values of the first write complete information and the second write complete information is different from the certain combination of the preset initial values.

51. (Withdrawn) A method in accordance with claim 49, wherein the first write complete information and the second write complete information have a certain combination of preset initial values,

said method further comprising the step of:

(g) identifying a combination of a current value of the first write complete information with a current value of the second write complete information, in the case where the first ink quantity-relating information stored in the first ink quantity information memory

division does not coincide with the second ink quantity-relating information stored in the second

ink quantity information memory division,

wherein said step (f) determines that the writing operation of the first ink

quantity-relating information into the first ink quantity information memory division has not

been carried out properly, in the case where the combination of the current values of the first

write complete information and the second write complete information is identical with the

certain combination of the preset initial values.

52. (Withdrawn) A method in accordance with claim 50 further comprising the

step of:

(h) writing the first ink quantity-relating information into the second ink quantity

information memory division.

53. (Withdrawn) A method in accordance with claim 52, wherein the first write

complete information and the second write complete information are flags.

54. (Withdrawn) A printer, to which an ink cartridge in accordance with any one

of claims 1 through 9 and 15 through 20 is detachably attached, said printer comprising:

a storage device that stores plural pieces of specific information,

wherein the plural pieces of specific information comprises information relating

to a quantity of ink kept in said ink cartridge; and a writing unit that writes the ink quantity-

relating information into the ink quantity information storage area of said ink cartridge,

preferentially over the other pieces of specific information.

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55. (Original) An ink jet printer comprising an ink cartridge, which is detachably attached to a printer main body and in which ink is kept, and said printer main body that causes the ink kept in said ink cartridge to be ejected from a print head to a printing medium, so as to implement printing on said printing medium,

wherein said ink cartridge comprises a storage device of sequential access type, said storage device comprising a storage unit and an address counter that carries out either one of a count-up operation and a count-down operation in response to a clock signal in the course of data transmission between said storage unit and said printer main body,

said storage unit included in said storage device comprises a first storage area, in which read only data are stored and which is only read by said printer main body, and a second storage area, in which rewritable data are stored and which ~~is accessed prior to the first storage area and transmits data to and from said printer main body~~is the area located within the storage device that is accessed for rewriting by said printer first before accessing for rewriting any other area within the storage device,

said ink jet printer has a data input-output unit that carries out reading and writing operations in response to a clock signal.

56. (Original) An ink jet printer in accordance with claim 55, wherein the rewritable data stored in the second storage area comprises data relating to a remaining quantity of ink in said ink cartridge, which is calculated by said printer main body from an amount of ink consumption used by said print head.

57. (Original) An ink jet printer in accordance with claim 56, wherein said ink cartridge comprises a plurality of ink chambers, in which a plurality of different color inks are kept respectively,

the rewritable data stored in the second storage area comprising data relating to remaining quantities of the different color inks kept in the respective ink chambers, which are calculated by said printer main body.

58. (Original) An ink jet printer in accordance with claim 57, wherein the second storage area comprises at least two memory divisions, into which latest data relating to the remaining quantity of ink are sequentially written.

59. (Withdrawn) An ink jet printer in accordance with claim 58, wherein the data relating to the remaining quantity of ink are written after a power-off operation of said printer main body.

60. (Withdrawn) An ink jet printer in accordance with claim 59, wherein the rewritable data stored in the second storage area comprises at least one selected among data regarding a time period elapsing after unsealing said ink cartridge and data regarding a frequency of attachment and detachment of said ink cartridge to and from said printer main body, both the elapsing time period and the frequency of attachment and detachment being measured by said printer main body.

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61. (Withdrawn) An ink jet printer in accordance with claim 60, wherein the read only data stored in the first storage area comprises at least one selected among data regarding a year, month, and date of manufacture of said ink cartridge, data regarding a type of ink stored in said ink cartridge, and data regarding a capacity of said ink cartridge.

62. (Withdrawn) An ink jet printer in accordance with claim 61, wherein said storage device is an EEPROM.

63. (Withdrawn) A printer, to which an ink cartridge in accordance with any one of claims 26 through 34 is detachably attached, said printer comprising:

a storage device that stores specific information that is to be written into said ink cartridge, wherein the specific information comprises information relating to a quantity of ink kept in said ink cartridge;

an ink quantity information writing unit that writes the ink quantity-relating information into a plurality of ink quantity information memory divisions, which are included in said storage device; and

a write complete information writing unit writing write complete information into a write complete information storage area when the writing operation of the ink quantity-relating information into each of the ink quantity information memory divisions has been completed, wherein the write complete information storage area is provided corresponding to each of the ink quantity information memory divisions in said storage device.

64. (Withdrawn) A printer in accordance with claim 63 further comprising:

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a determination unit that determines whether or not the writing operation of the ink quantity-relating information into each of the ink quantity information memory divisions has been carried out properly, based on values of the ink quantity-relating information written in the ink quantity information memory divisions and values of the write complete information written in the write complete information storage areas.

65. (Withdrawn) A printer, to which an ink cartridge in accordance with any one of claims 26 through 34 is detachably attached, said printer comprising:

a storage device that stores specific information that is to be written into said ink cartridge, wherein the specific information comprises information relating to a quantity of ink kept in said ink cartridge;

a first ink quantity information writing unit that writes first ink quantity-relating information into a first ink quantity information memory division, which is included in said storage device;

a first write complete information writing unit that writes first write complete information into a first write complete information storage area when the writing operation of the first ink quantity-relating information into the first ink quantity information memory division has been completed, wherein the first write complete information storage area is provided corresponding to the first ink quantity information memory division in said storage device;

a second ink quantity information writing unit that writes second ink quantity-relating information into a second ink quantity information memory division following the writing operation of the first write complete information into the first write complete information

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storage area has been completed, wherein second ink quantity information memory division is

included in said storage device; and

a second write complete information writing unit that writes second write

complete information into a second write complete information storage area when the writing

operation of the second ink quantity-relating information into the second ink quantity

information memory division has been completed, wherein the second write complete

information storage area is provided corresponding to the second ink quantity information

memory division in said storage device.

66. (Withdrawn) A printer in accordance with claim 65 further comprising:

a determination unit that determines whether or not the writing operations of the

first ink quantity-relating information and the second ink quantity-relating information

respectively into the first and second ink quantity information memory divisions have been

carried out properly, based on values of the first ink quantity-relating information and the second

ink quantity-relating information written in the first and second ink quantity information memory

divisions and values of the first write complete information and second write complete

information written in the first and second write complete information storage areas.

67. (Withdrawn) A printer in accordance with claim 66, wherein said

determination unit determines that the writing operations of the first ink quantity-relating

information and the second ink quantity-relating information respectively into the first and

second ink quantity information memory divisions have been carried out properly, in the case

where the first ink quantity-relating information stored in the first ink quantity information

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memory division coincides with the second ink quantity-relating information stored in the second

ink quantity information memory division.

68. (Withdrawn) A printer in accordance with claim 67, wherein the first write

complete information and the second write complete information have a certain combination of

preset initial values,

     said printer further comprising;

     an identification unit that identifies a combination of a current value of the first

write complete information with a current value of the second write complete information, in the

case where the first ink quantity-relating information stored in the first ink quantity information

memory division does not coincide with the second ink quantity-relating information stored in

the second ink quantity information memory division,

     said determination unit determining that the writing operation of the first ink

quantity-relating information into the first ink quantity information memory division has been

carried out properly, in the case where the combination of the current values of the first write

complete information and the second write complete information is different from the certain

combination of the preset initial values.

69. (Withdrawn) A printer in accordance with claim 67, wherein the first write

complete information and the second write complete information have a certain combination of

preset initial values,

     said printer further comprising:

an identification unit that identifies a combination of a current value of the first

write complete information with a current value of the second write complete information, in the

case where the first ink quantity-relating information stored in the first ink quantity information

memory division does not coincide with the second ink quantity-relating information stored in

the second ink quantity information memory division,

said determination unit determining that the writing operation of the first ink

quantity-relating information into the first ink quantity information memory division has not

been carried out properly, in the case where the combination of the current values of the first

write complete information and the second write complete information is identical with the

certain combination of the preset initial values.

70. (Withdrawn) A printer in accordance with claim 69, wherein said first ink

quantity information writing unit and said second ink quantity information writing unit

preferentially carry out the writing operations into the first ink quantity information memory

division and the second ink quantity information memory division in said storage device,

respectively.

71. (Withdrawn) A printer in accordance with claim 70, wherein the first write

complete information and the second write complete information are flags.

72. (Currently Amended) A storage device mounted on an ink cartridge, which is

configured to be detachably attached to a printer, said storage device comprising:

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an address counter that outputs a count in response to a clock signal output from

said printer; and

a storage element that is sequentially accessed based on the count output from

said address counter and has a storage area, in which plural pieces of specific information are

stored in a readable, writable, rewritable and non-volatile manner <u>at an area storing the specific</u>

<u>information and located within the storage element that is accessed for rewriting by said printer</u>

<u>first before accessing for rewriting any other area within the storage element,</u>

<u>wherein the specific information relates to a quantity of ink kept in the ink</u>

<u>cartridge.</u>

73. (Currently Amended) A storage device in accordance with claim 72, wherein

the storage area has a first storage area and a second storage area, wherein the first storage area

stores a plurality of read only information, and wherein the second storage area is arranged at a

place accessed for rewriting prior to the first storage area and stores information relating to a

quantity of ink kept in said ink cartridge.

74. (Original) A storage device in accordance with claim 72, wherein the storage

area has an ink quantity information storage area, in which information relating to a quantity of

ink kept in said ink cartridge is stored and which is included in a specific area written first by

said printer.

75. (Original) A storage device in accordance with claim 74, wherein said storage

element stores format information relating to items of information stored therein.

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76. (Original) A storage device in accordance with claim 75, wherein the format information is registered in a head area of said storage element.

77. (Original) A storage device in accordance with claim 76, said storage device is an EEPROM.

78. (Withdrawn) A storage device mounted on an ink cartridge, which is configured to be detachably attached to a printer, said storage device comprising:

a storage element having a plurality of ink quantity information memory divisions and a plurality of write complete information storage areas, and storing specific information in a readable, writable, and non-volatile manner,

wherein the specific information comprises information relating to a quantity of ink kept in said ink cartridge, wherein the plurality of ink quantity information memory divisions stores the ink quantity-relating information, and wherein the plurality of write complete information storage areas respectively correspond to the plurality of ink quantity information memory divisions and in each of which write complete information is registered when a writing operation into the corresponding ink quantity information memory division is completed.

79. (Withdrawn) A storage device in accordance with claim 78, wherein said ink cartridge comprises a plurality of ink reservoirs, in which a plurality of inks are kept respectively, and

said storage element comprises a plurality of ink quantity information memory

divisions and a plurality of write complete information storage areas provided for each of said

plurality of ink reservoirs.

80. (Withdrawn) A storage device in accordance with claim 79, wherein said

storage element has two ink quantity information memory divisions, and each write complete

information storage area is located after an end-of-writing position in each of the ink quantity

information memory divisions.

81. (Withdrawn) A storage device in accordance with claim 80, wherein a

predetermined flag is written into each of the write complete information storage areas when the

writing operation has been completed in the corresponding ink quantity information memory

division, and

the predetermined flag has different initial values with regard to the respective

write complete information storage areas.

82. (Withdrawn) A storage device in accordance with claim 80, wherein a

predetermined flag is written into each of the write complete information storage areas when the

writing operation has been completed in the corresponding ink quantity information memory

division, and

the predetermined flag has an identical initial value with regard to the respective

write complete information storage areas.

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83. (Withdrawn) A storage device in accordance with claim 82, wherein the ink quantity information memory divisions are included in a specific area of said storage element that is written first by said printer.

84. (Withdrawn) A storage device in accordance with claim 83, said storage device further comprising:

an address counter that outputs a count in response to a clock signal output from said printer,

wherein said storage element is sequentially accessed, based on the count output from said address counter.

85. (Withdrawn) A storage device in accordance with claim 84, wherein the ink quantity-relating information regards a remaining quantity of ink in said ink cartridge.

86. (Withdrawn) A storage device in accordance with claim 84, wherein the ink quantity-relating information regards a cumulative amount of ink consumption with regard to said ink cartridge.

87. (Withdrawn) A computer-readable medium, in which a program is recorded., said program being used to write specific information into an ink cartridge having a storage element, the specific information comprising information relating to a quantity of ink kept in said ink cartridge,

said program comprising:

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a program code that causes a computer to write the ink quantity-relating

information into a plurality of ink quantity information memory divisions, which are included in

said storage element; and a program code that causes the computer to write write-complete

information into a write complete information storage area, which is provided corresponding to

each of the ink quantity information memory divisions in said storage element, when the writing

operation of the ink quantity-relating information into each of the ink quantity information

memory divisions has been completed.

88. (Withdrawn) A computer-readable medium in accordance with claim 87, said

program further comprising:

a program code that causes the computer to determine whether or not the writing

operation of the ink quantity-relating information into each of the ink quantity information

memory divisions has been carried out properly, based on values of the ink quantity-relating

information written in the ink quantity information memory divisions and values of the write

complete information written in the write complete information storage areas.

89. (Withdrawn) An ink cartridge having an ink reservoir in which an ink used for

printing is kept, said ink cartridge comprising:

an address counter that outputs a count in response to an input clock signal; and

a storage element that is sequentially accessed based on the count output from

said address counter, said storage element storing plural pieces of specific information in a

readable, writable, and non-volatile manner,

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wherein a certain piece of information, which is updated in relation to the ink kept

in said ink reservoir, is stored in a specific area of said storage element that is read first using a

default of the count.

90. (Withdrawn) An ink cartridge in accordance with claim 89, wherein the

certain piece of updated information regards a remaining quantity of ink.

91. (Withdrawn) An ink cartridge in accordance with claim 89, wherein the

certain piece of updated information regards an amount of ink consumption.

92. (Withdrawn) An ink cartridge in accordance with claim 91, wherein the

amount of ink consumption has an initial value in a range of zero to a predetermined value.

93. (Withdrawn) An ink cartridge in accordance with claim 92, wherein the

predetermined value includes 90.

94. (Previously Presented) An ink cartridge according to claim 1, wherein the ink

quantity-relating information is written in the storage area before other information is written in

the storage area.

95. (Previously Presented) An ink cartridge according to claim 1, wherein when

the printer reads information from the ink cartridge, the printer accesses the ink quantity

information storage area

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96. (Previously Presented) An ink cartridge according to claim 1, wherein when

the printer reads information from the ink cartridge, the printer accesses the ink quantity

information storage area before accessing other portions of the storage unit.

97. (Currently Amended) An ink cartridge according to claim 1, wherein when the

printer reads information from the ink cartridge, the printer accesses the ink quantity information

storage area after accessing an-otheranother portion of the storage unit.

98. (Previously Presented) An ink cartridge configured to be detachably

mountable on a printer, comprising:

an ink reservoir for keeping ink; and

a non-volatile serialsequential access memory being sequentially accessed from

an access start position in synchronism with a clock signal, the memory having a first memory

area for storing data not to be updated according to use of the ink cartridge and a second memory

area for storing data to be updated according to use of the ink cartridge,

wherein the second memory area has a specific area for storing ink quantity data

related to consumption of the ink, the specific area being located at a front end of the second

memory area which is to be written first in writing data to the second memory area.

99. (Previously Presented) An ink cartridge in accordance with claim 98, wherein

the second memory area is located at a first half of an entire memory space of the non-volatile

serialsequential access memory.

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100. (Currently Amended) An ink cartridge configured to be detachably attached

to an ink-jet printer, comprising:

an ink storage reservoir; and

a non-volatile ~~serial~~sequential access storage element that stores data, the storage

element having:

a first storage area for storing read-only data ~~at a first address~~, and

a second storage area for storing rewritable data ~~at a second~~

~~address, the second address being lower than the first address~~ pertaining to

ink-quantity related information, wherein the second storage area is

accessed for rewriting by the printer first before accessing for rewriting

any other area within the storage element.

101. (Currently Amended) An ink cartridge according to claim 100, wherein the

second ~~address being lower than the first address means that the second address~~storage area is

closer to ~~a beginning of~~a start address for being accessed by said printer in the storage device

than the first ~~address~~storage area.

102. (Currently Amended) An ink cartridge according to claim 100, wherein the

~~rewritable data~~ink-quantity related information reflects a quantity of ink remaining in the ink

storage reservoir.

103. (Previously Presented) An ink cartridge according to claim 100, wherein the

read-only data reflects at least one of a time at which the ink cartridge was unsealed, a version of

the data stored, a type of ink contained in the ink storage reservoir, a time at which the ink

cartridge was manufactured, a serial number of the ink cartridge, and an indication as to whether

the ink cartridge is new or recycled.

104. (Previously Presented) An ink cartridge according to claim 100, wherein a

maximum amount of the first data that the first storage area can store is equal to a maximum

amount of the second data that the second storage area can store.

105. (Currently Amended) An ink cartridge according to claim 100, wherein at

least one of the read-only data and the rewritable data comprises a plurality of data records, and

~~the data records are sequentially arranged~~.

106. (Previously Presented) An ink cartridge according to claim 100, wherein a

first said data record has a first size and a second said data record has a second size, and the first

and second sizes are different.

107. (Currently Amended) An ink cartridge according to claim 100, wherein the

~~rewritable data~~ink-quantity related information reflects an amount of ink consumption in the ink

storage reservoir, said amount of ink consumption having an initial value in a range from zero to,

a predetermined value.

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108. (Currently Amended) A method of providing a plurality of data in an ink

cartridge that is configured to be detachably mountable on a printer, the ink cartridge having a

non-volatile ~~serial~~sequential access memory, comprising the steps of:

first, storing read-only data ~~at a first address in~~in a first storage area of the

memory; and

second, storing rewritable data, pertaining to ink-quantity related information at a

second ~~address in~~storage area of the memory, wherein the second ~~address is closer to a beginning~~

~~of the storage device than the first address~~storage area is accessed for rewriting by said printer

first before accessing for rewriting any other area within the memory.

109. (Currently Amended) A method according to claim 108, wherein the

~~rewritable data~~ink-quantity related information reflects a quantity of ink contained in the ink

cartridge.

110. (Previously Added) A method according to claim 108, wherein the read-only

data reflects at least one of a time at which the ink cartridge was unsealed, a version of the data

stored, a type of ink contained in the ink storage reservoir, a time at which the ink cartridge was

manufactured, a serial number of the ink cartridge, and an indication as to whether the ink

cartridge is new or recycled.

111. (Previously Presented) A method according to claim 108, wherein a

maximum amount of the read-only data that is stored is equal to a maximum amount of the

rewritable data that is stored.

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112. (Currently Amended) A method according to claim 108, wherein at least one

of the read-only data and the rewritable data comprises a plurality of data records, and the data

records are sequentially arranged.

113. (Previously Presented) A method according to claim 112, wherein a first said

data record has a first size and a second said data record has a second size, and the first and

second sizes are different.

114. (Currently Amended) A method of retrieving data from an ink cartridge that

is configured to be detachably mountable on a printer, the ink cartridge having a non-volatile

serialsequential access memory, the memory containing read-only data at a first address and

rewritable data at a second address in the memory, wherein the second address is closer to a

beginning of the storage device than the first addressthe first address, comprising the step of:

reading the second data without reading the first data..

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